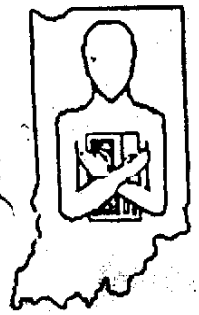

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JANUARY 1993 The HUGgers Newsletter Volume 12, Number 1

PANDA EXPANSION BOX - A REVIEW

by Bryant C. Pedigo

Last May at the Lima, Ohio, Multi-User Group Conference I purchased a Panda Expansion Box, which is a modified IBM mini-tower case marketed by Bill Nelson of Panda Computer Products in Garden Grove, California.

The Panda Box has several advantages over the TI PEB. The formost of which is a 200 Watt power supply capable of running four floppy drives AND a hard drive all installed internally. (There are spaces for 2 half height 5 1/4 and 2 3.5 inch floppy drives as well as a 3.5 inch hard drive). Additionally, the Panda Box has a reset switch, a power connector at the back for use with a monitor, a VERY quiet cooling fan, and a compact contemporary design. For Geneve users there is a keyboard port on the front, and a card protector with a support post to help support the protruding part of the Geneve card which must be installed in the 2nd slot from the bottom.

Although it is designed for use with a Geneve 9640 in mind it can easily be used with a TI99/4a. Although I purchased it to use with my Geneve, I did try it out with a 99/4a. Unlike the Rave Expansion Box, you have to use the flex cable interface card if you want to use plan to use a 99/4a.

The inside of the Panda Box has been modified to accept TI style cards inserted horizontally. Because the power supply has a regulated +/- 12v output, any cards that use either a 7812 or a 7912 voltage regulator require modification in the form of a jumper to short out the +/- 12 volt regulators. The directions include complete information as to which cards require this modification and how to jumper both types of regulator.

The directions are for the most part complete and easy to follow. One item that was not mentioned and which proved to be a major problem for me was that the power supply used must have a minimum power draw in order to work. Because of a problem that developed with my hard drive, I tried to set the Panda Box up with a Geneve, one 5 1/4 drive and two 3.5 drives. It would start to power up then turn off. With a 99/4a there was no problem. Upon contacting Mr. Nelson, he had me send the box along with my Geneve to him. Upon checking the system out it was not drawing enough power without a hard drive installed. Upon getting the box back again, adding a 2nd 5 1/4 floppy drive solved the power draw problem.

I have been using the system for several months now in the above configuration without any problems. I recently had an opportunity to test it with both internal and external borrowed hard drives and had no problems. I have noticed that cards seem to run as hot in the Panda Box as they do in the TI PEB, therefore it would probably be a good idea to block off those parts of the ventilation grill at the rear that do not have cards installed so that air flow where there are cards will be increased.

After having used the Panda Box for about 6 months now and having successfully tested it with several different configurations, I don't have any qualms about recommending it. Especially since Mr. Nelson of Panda Computer Products provides excellent support. Panda Computer Products can be reached at 714-750-6425. If I remember correctly, the Panda Boxes are priced in the vicinity of $250.

HUG OFFICERS		
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This news letter is brought to you by the efforts of the officers & members of the Hoosier Users Group.

THE OPPINIONS EXPRESSED HEREIN ARE THE AUTHORS', and DO NOT NECESSARILY REFLECT THOSE OF THE PUBLISHERS.

MEMBERS ARE ENCOURAGED TO SUBMIT ARTICLES FOR PUBLICATION.-PLEASE!

REMEMBER
This is YOUR user group too!

MONTHLY MEETING LOCATION
LITTLE HOUSE NEXT TO
ST. ANN'S SCHOOL
2839 S. McCLURE
INDIANAPOLIS, IN

MEETING STARTS
AT 2:00 P.M.
JANUARY 17, 1993

MODEM/VOICE

This feature is especially useful when you want to talk about the data connection thats about to occur, such as the name and number of files to be transferred.

When you receive the incoming call, pick up the phone and begin talking.

When you are both ready to let your modems exchange data;

The person answering the call types AT A and presses ENTER.

The person originating the call types AT D and presses ENTER.

Once you both have typed your commands and entered then hang up the phones.

You should be able to communicate via the modem again.

Little tricks of the trade make communicating via a modem a lot easier than first thought.

HUG BBS UPDATE
by William M. Lucid

The Hoosier Users Group almost had the new S&T BBS running; however, problems were encountered. Before the co-sysop's took the S&T BBS off-line nine users were able to connect! One of the problems was the lack of GAMEROOM programs, which caused the bbs to crash. Another area of trouble was the REMOTE section of the bbs. This is a VERY powerful tool for the co-sysop's, allowing updating of users remotely, control of various areas of the bbs, ability to do ANY file manager type function. The message base will take some getting used to...for one thing messages will SCROLL OFF when maxium number of message has been reached. Messages bases are checked automatically after logon. You are given the ability to choose the message bases you want to read in a utility called setup (all users have access to this utility). One difference you will notice in the message area of the bbs is private mail is ONLY available in the E-mail/Softmail message base.

The file transfer area can hold 25 directories, the 26 directory is reserved for softmail. Softmail is a function that allows you to attach a file to a message without using the file transfer section of the bbs. Only the person the message is addressed to can download the file! This should be just the ticket for exchanging newsletter articles with Bob Stahlhut. File transfers can use one
of the following protocal: Xmodem, Xmodem CRC, 1K-Xmodem, Single MT Ymodem, 1k-Ymodem, Tibbs Xmodem, Telco Ymodem, Mass Transfer Mutiple X/Ymodem, and Ymodem batch.

ANSI (IBM) graphics are used for many menu applications and can be turned on or off at will. Color ANSI is supported; and of course, the software offers the option of 40 or 80 column display mode.

Presently while we await Tim Tesch's delivery of a working version, we are back to running TEXLINK bbs software. I apologize for the problems with TEXLINK, I put wrong disk in disk drive one and it has been giving error messages when anyone tries to download a file. I believed Tim Tesch's delivery of the new and latest version of S&T BBS was to be eminent.....so, on goes the WAIT!!!

"Did you get the memo about the new password?"

BBS

Hoosier Users Group
Baud rate: 300/1200/2400
On Line 24 Hours Daily

317-702-774A

Now with a Hard Drive
40 MEG ON LINE

S&T BBS (c)5/10/92 S&T Software, Ltd.
Documentation Copyright (c)1992 by Tim Tesch. All rights reserved.

This is a partial summary of the S&T BBS. Addendums and updates are generally mailed at 4-month intervals or as required by each individual. The BBS will work decently at 4800 baud - possibly higher with a Geneve. The S&T BBS is an assembly/XB hybrid making changes and customization very easy. ANSI Graphic editting is available for the TI and the Geneve via my program called ANSI-TOOLS - an ANSI graphic editor usable with most word processors.

Full pathnames are supported for all system files. BBS files are setup in the LOADer and all other programs rely on that setup. Changing the BBS to run on a RAMdisk or Harddrive is very simple and requires minimal work.

Minimum Requirements:
- Geneve or TI system
- 32K (if using TI system)
- RS232 (TI, Myarc, or CorComp)
- Disk Controller (TI, Myarc, or CorComp)
- Extended BASIC module or GRAM equivalent
- Hayes Compatible Modem

Extra Usable Hardware:
- 80 column card (questionable)
- Horizon RAM disks
- Triple Tech (for time/date)
- MPB card (time/date)

Operating Systems as of 5/10/92:

Graphics Clipper	(414)-284-6108	3/12/24	24hours	WI
The Challenger	(813)-787-4902	3/12/24	24hours	FL
Milwaukee Area User Group	(414)-259-9659	3/12/24	24hours	WI
The Orphanage	(918)-288-6708	3/12/24	7am-7pm	OK
Snafu	(618)-236-7907	3/12/24	24hours	IL

++*+

<< SYSOP SUPPORT PROGRAMS >>

LOAD	- System file setup, transfer setups and utilities
UPDATE	- Edit/Add users, create data files, printout files.
REMOTE	- Remotely edit accounts, file transfer directories, and text files. A text editor is included.
ANSI-TOOLS	- v5.2 allows you to make use of standard IBM graphic character to make menus, bulletins, etc. Telco, Mass Transfer 4.4 and higher, and IBM users can see the graphics.
OTHERS....	- More programs area available but not listed.

<< ASSEMBLY Support Highlights: >>

VDP protection	- Safeguards have been placed in the assembly to prevent lockups
Active HOTKEYS	- Hotkeys allow instant keypresses during menus, messages, prompts, etc. Hotkeys are VERY easy to use and are present in almost all areas of the BBS.
ANSI toggling	- Allows graphics to be toggled on/off for non-ansi emulation.
Geneve Clock	- Time/date can be accessed from these clocks. Depending on
Tripletech Clock and MBP clock	- space considerations these links may or may not retain the am/pm 12 hour format currently being used.
Color Changes	- SysOp's fore/background colors can now be changed easily!
80 columns for Geneve / 80-column card	- The 80-column assembly for the S&T was completed to allow the SYSOP to view the board in 80 columns also!!!! The screen is divided into a 23-line window and 3 line status window. 128 graphics and 4/23 line modes are supported.
2K (8 sector) File Transfers	-Using special DSR routines the file transfer buffer in the TI version has doubled from 1K to 2K. This represents a big improvement for both the SysOp and the users.
DSR support for both assembly versions	-All text files are displayed via ASSEMBLY. There is no XB intervention so all text is printed very quickly! Hotkeys, ANSI graphics, and all normal operations are *active*. Text from floppy drives rarely pauses and text from RAMdisks or hardrives matches IBM-BBS speeds.
	--> o The DSR routines support reading of DV80 and DF128 files.
	--> o IBM Text Files in DF128 format will be printed properly *without* being changed! This means ANSI screens with color can even be used with the BBS without any problems!
Screen/Modem Input/Output Control	-Output/Input to the screen and/or modem can be turned on and off via the assembly. By turning off the SysOp's screen maximum output speed is achieved - something VERY noticable to the users! Input/output from/to the modem can be controlled making SysOp usage of the BBS very simple.
Transfer Protocols	-NINE protocols area available including multiple and single transfer methods for a variety of terminal emulators. All nine are listed earlier in this article. YMODEM-BATCH was the latest addition.
Hard-Disk Support	-Text files can be read from the hard drive and downloading from hard drives is working. Uploads are being worked on.
VDP "RAM-Disk"	-The extra VDP memory in the Geneve (about 80K) is available for text file storage. Once loaded into memory, text files can be recalled very quickly. Hotkeys, ansi, etc is all supported. h 128K of VDP, the amount of memory available is 80K. 80 column cards w/192K can use about 144K for storage.
Ansi Graphics For SysOp in the 40 Column Assembly!	-The graphics available in ANSI-TOOLS are now viewable on the TI by way of some conversion programming. Now you can view these ANSI graphics even if you don't own an 80-column card or a Geneve. All of this is available from Extended BASIC!!!
NOTE:	Some systems/disk controllers will only work properly with 1K file transfers. Effort will be made to suit your system.

<MASS TRANSFER> UPDATES Version 4.5 for TI/Geneve	Very quickly, Mass transfer now supports ANSI-graphics, strips unwanted ANSI codes, hardware toggling from the menu, return to FunnnleWriter, ANSI-Tools support for buffer saving, and 1104 ansi graphics characters! The 80 column version detects and decodes ANSI commands just like Telco can - nice for IBM BBS's and even some of the new games for the S&T BBS like Reno Keno. 1K-Xmodem and Ymodem-BATCH have also been added to both the 40 and 80 columns of these versions. Versions containing these addditional protocols will be released to the public sometime this summer. Buffer captures contain the real graphics - not stars like Telco. Spooled text also prints the graphics now! Even editting the graphics is possible with ANSI-TOOLS.

TALES OF A POWER SUPPLY

By AL Beard, 9T9 Newsletter

Ever noticed your PEB gets really hot? Wished for a hard drive mounted in the PEB but know your PEB power supply can't handle it? Tired of your GENEVE and HDFC cards slowly turning brown around the power regulators?

I've been worried about it for quite some time... Tony Lewis advised me a while ago that the PEB power supply wasn't really designed for all these new drives and cards being mounted in them. After losing a power supply (and sending $50.00 to TI to get a new one) I decided that the way to go was to replace the power supply with a new "switching" type supply.

TI designed the power supply around the technology of the time. The power supply is a "linear" supply. That means that your PEB has inside, a huge power transformer, with simple regulating circuits that provide the power to the bus in the TI computer.

A switching supply avoids the huge transformer and heat problems by switching the power on and off very quickly (this has caused some interesting problems in offices that contain large amounts of PC based equipment). Switching supplies are very cheap due to their wide applicability to PCs.

One mistake (in terms that it has caused untold grief for board designers of the PEB) is that the TI linear power supply is underpowered and generates too high a voltage for the cards on the bus of the PEB.

This is what the TI PEB manual says the voltages going to the PEB bus should be out of the power supply:

Brown - +16v
Yellow - -16v
Green - + 8v
Black - Ground

Per the TI design, the cards you plug into the PEB must drop these voltages to something they can tolerate with their circuits:

+16v drops to +12v
-16v drops to -12v
+ 8v drops to + 5v

This isn't too bad, but the actual voltages I measured coming out of the TI supply were even higher than listed (I measured +20v instead of +16v, etc.). The drop in voltage means the cards must get rid of the excess energy somehow and that means HEAT!

Also, the power going to the floppy drive(s) is not adequate for two full height drives, or even one 5 1/4" hard drive. I wanted to mount a 5 1/4" drive along side a 1/2 height floppy drive for a complete self-contained machine.

A NEW SUPPLY

Browsing at the Trenton Computer Fair (in pouring rain) I found a Highland brand new power supply for $50. Not a bargain, but I didn't want to trust this project to a used supply or one without a guarantee. The supply I picked up came mounted in a metal case ready to drop into an IBM AT compatible. Because it was mounted in a metal case, it came with a few extra goodies, like a new power connector for the back of the PEB and a low voltage (and quieter) fan.

The supply I picked up is a 200 watt supply, which I decided would have enough for my PEB with full complement of cards.

I started this project on a Sunday evening by opening up my PEB (I have a spare so I wasn't too worried about destroying this PEB) and removing the following from the left hand power section of the PEB:

a. Power Transformer (remove four nuts)
b. Terminal strip (remove two nuts)
c. Power connector (remove two screws)
d. Power Supply (remove two screws and unsolder wires to PEB bus)
e. Fan (remove four nuts)

I kept the wiring to the front power switch and to the fuse (new model PEBs seem to have removed the fuse on the rear of the PEB). I carefully cut the two wires from the front power switch and soldered the 120 VAC power connections to the power plug which goes to the new power supply.

Working on the new power supply, I unscrewed the low voltage fan and mounted it on the back of the PEB after first cleaning everything in the PEB (amazing how dirty it gets after six years!) using the four nuts which held the previous fan. I unsoldered the 110/220 VAC switch on the power supply and soldered the wires together (to force 110VAC) and taped the wires to prevent a short.

(continued on next page)

Deciding how to mount the new power supply took much of my time. I finally decided to use the plastic verticle mounting unit from the old TI PEB power supply, and drill a couple of holes and mount the new supply board to it. The new power supply then mounted vertically in the same manner as the old supply.

Fortunately, the new power supply came with several disk drive connectors (four to be exact). I removed one of the disk drive cables (cut it off).

The power supply also comes with connectors which are intended to plug into an IBM PC compatible motherboard. I also cut these off and removed all the wires except for the wires which had the following voltages:

+ 12V
- 12V
+ 5V
ground

I then soldered these wires to the bus in the same place as:

+ 12V went to BROWN
- 12V went to YELLOW
+ 5V went to GREEN
Ground went to BLACK

(Warning: If you decide to try this yourself, try and make sure that the cables going to the drive connectors are long enough to run behind the cards in the PEB. Mine were a bit short but were still usuable.)

Next came the hard drive. I just mounted the hard drive and the floppy drive side by side in the PCB and ran the cables out of the box before putting the whole thing back together.

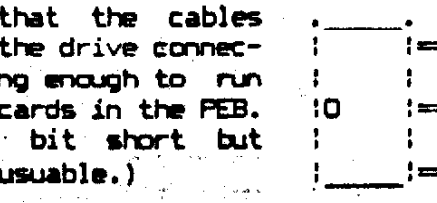
CARD MODIFICATIONS

Here is the nasty part of the power supply changeout, every card that you plug into the PEB will require a modification and the card with the modification cannot be plugged into as standard PEB without blowing out the card. Time for a nice BIG caution sticker on the card.

The modification is quite simple, and is because the cards no longer need to do their own power regulation. The power on the bus (+ 12V, - 12V, and + 5V) will have the right voltages for the cards to run. The modification involves jumpering out all the voltage regulators each board.

One way to do this is to remove all power regulators and then jumper across the contacts. I chose a simpler way which lets me remove the modification in the future if I so desire. (remember, also, at this point I wasn't quite sure this was all going to work!).

The voltage regulators have three prongs connected to a square body, and are usually located near the bottom of the card (usually one or two right next to the LED which sticks out the front):



The middle connection is ground, and should be left alone. I made up small jumpers for the outer two connections, and soldered all of them on the PC-side of the board.

RESULTS

I modified the GENEVE card, held my breath, and turned on the power. Relief followed as the normal GENEVE Swan Screen appeared. I then modified my HFDC card and plugged in the hard drive. The system booted normally (so far so good). Next I modified my TI disk controller (it was a bit hard to get the case apart) and plugged in the floppy drive. The floppy checked out fine. The last card I modified was a Myarc RS232, everything was OK.

I have several more cards to modify and try, including Ron Walters fabulous MEMEX 2-megabyte memory expansion card and a speech synthesizer card (somewhat useless in the GENEVE until the next MDOS release). I'm going to check with Ron on the memory expansion card.

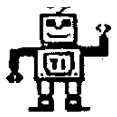
SUMMARY:

Was it worth the trouble? Total project time was three evenings of about six hours total. My PEB runs cool and quiet and my cards are no longer turning brown. I have the peace of mind of a totally integrated computer within the PEB with a hard drive!

It was worth the trouble for me, and gave me a little respite from a long haul in programming.

Of course, I wouldn't try this yourself, unless you have a pretty good knowledge of computer hardware and power supplies. In any case you are on your own.

A.L. Beard



COMPUTER CONTROLLED ROBOT

By Ken Gladyszewski

CONTROL A ROBOT OR ANYTHING USING "PIO"

Some years ago while visiting my local Radio Shack, I discovered a robot called "The Mobile Armatron" and immediately decided that controlling this robot with my computer would make a great project. So did Radio-Electronics Magazine in an article which appeared in their May 1987 issue using a Commodore 64. This simple robot consists of five motors which cause different motions when energized by a handheld remote attached to the robot via a two foot, seven conductor ribbon cable. The remote consists of a number of pushbuttons which when pushed connect the wires of the ribbon cable in various combinations to energize one of the motors in a given direction. After reading and understanding the article, I concluded the TI parallel port is similar to the Commodore user port and could be used in a like manner to control the robot. These ports both have 8 data bit outputs which can be used to drive relays whose contacts then act just as the pushbuttons did in the remote. My design for the interface uses SPDT relays instead of the SPST relays used in the article and only 6 instead of 7 of the 8 available data bits. In addition to less hardware, the contacts are interconnected so that each motor acts as a generator when power is removed, causing the motion to stop quickly instead of coasting. The remaining bits can be used for other purposes, such as speed control, by switching out resistors to vary the voltage to the motor.

Before attempting to write the program and design the interface, I did some investigation into the workings of the parallel port and learned the following:

The parallel port on the TI RS232 card is bi-directional, meaning the port may be used to input as well as output information. A printer and the robot use the output ability solely and can be used with a parallel interface that can only output data, such as the Axiom parallel. The connector on the TI card is a 16 pin IDC type having 2 rows of 8 pins, per Fig. 1. The data bits are connected to a pair of cross wired 74LS373, 8 bit transparent latch IC's. These chips are capable of sinking 18 MA (input mode) and sourcing 6 1/2 MA (output mode). LED's and relays (even low power reed type) require more current than this and must be driven by a transistor.

When the computer outputs a byte, it causes the "handshake out" line to go high when the "data bit" lines have all changed. The data lines are latched, i.e., they remain in their last state until changed by new information. The peripheral device must cause the "handshake in" line to go low when it has read the data lines. The computer is then allowed to change the "data bit" lines to output another byte.

This information was used to design the universal interface shown in Fig. 2. The design is modular using a handful of inexpensive generic parts which are easily obtainable. All relay contacts are wired to a 25 pin D-Sub connector (like the one used with the RS232 serial port). Interconnections between the contacts required to use the interface with the robot are made in the mating interface cable WHICH attaches between the interface box and the robot ribbon cable. Using this approach, one interface may be used for many different projects, each with it's own custom cable. Almost anything can be controlled using this interface and some imagination! These relays could energize bigger relays if final devices require a large amount of power. The program in Fig. 3 shows how keys 0-9 on the computer keyboard may be used to energize one or more relays at a time.

The actual program for the robot includes unlimited speech and the ability to store motion commands to disk. The commands may be input to the computer interchangeably through the keyboard or the handheld remote attached to the joystick port. The program is in this newsletter. It consists of 120 lines of Extended Basic with no Assembly routines, except for the text-to-speech routine. The program could be re-written to run in Basic on a console, using the Terminal Emulator cartridge, a cassette recorder and a stand alone parallel port.

If you have a Mobile Armatron and would like to computerize it now, or have other uses for this information and can't wait - - - write to me!

Ken Gladyszewski
6440 St. Rte 86
Concord, OH 44077

Editor's note:

It must be very hard putting all this effort into letting others know what amazing things our TI can do when there is very little feedback from the readers. Ken told me this project has spawned many more ideas that cannot possibly be looked into without the help of other hardware hackers, as time is always an enemy which can't be overlooked! Please write Ken if you would like to get involved in this project or any other that Ken has written about in the past. Also, write Ken, just to let him know if you like his ideas or not. This way, you may see more projects printed in this Newsletter!. Thanks, Harry

By

Ken Glodysewski

SCHEMATIC FOR COMPUTER CONTROLLED ROBOT

NOTES:
1. R6, R7, R9, R10, Q6, Q7, RY6, RY7, OPTIONAL FOR SPEED CONTROL, IF NOT USED, SHORT PIN 14 TO 17.
2. 5 VOLT RELAYS MAY BE POWERED BY PIN 12 OF PARALLEL PORT (JUMPER X & Y). SOME 12 VOLT RELAYS MAY BE POWERED BY 9V BATTERY (JUMPER Y & Z).
3. RESISTORS R0-R8 AND TRANSISTORS Q0-Q8 MAY BE REPLACED BY OPTO-ISOLATOR INTEGRATED CIRCUIT.

K.J.GLADYSZEWSKI 5/01/92
MC99ERS CLEVELAND,OHIO

PARTS LIST:
Q0-Q8 GENERAL PURPOSE NPN SWITCHING TRANSISTOR RADIO SHACK 276-1617
RY0-RY7 SPDT RELAY RADIO SHACK 275-241 (12V) OR RADIO SHACK 275-240 (5V)
R0-R8 1K OHM RESISTOR 1/4W RADIO SHACK 271-1335
DB25P RADIO SHACK 276-1547
DB25S RADIO SHACK 276-1548
HDDD RADIO SHACK 276-1549
DE9P RADIO SHACK 276-1537
DE9S RADIO SHACK 276-1538
HDDD RADIO SHACK 276-1539

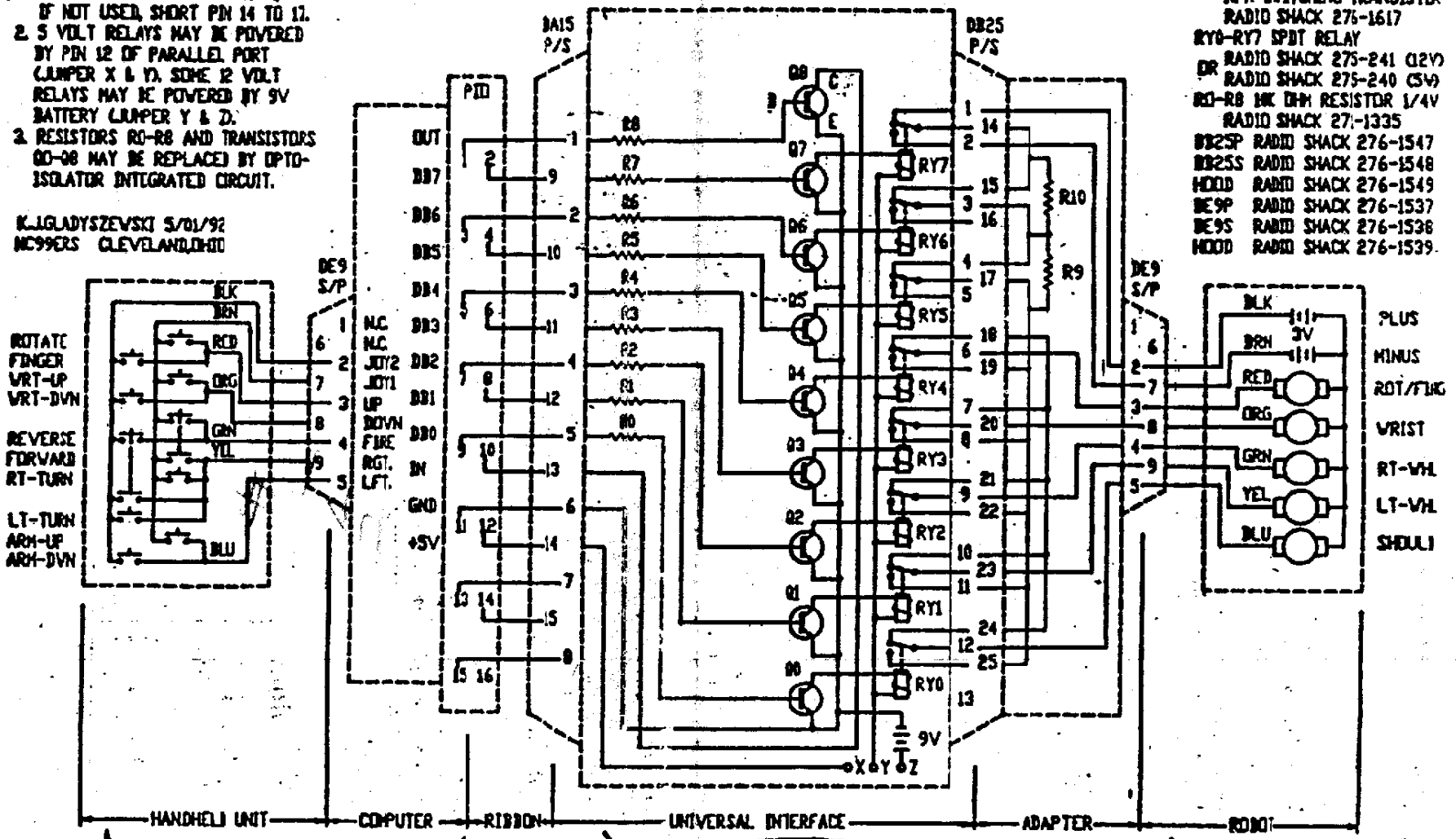


FIG. 1

FIG. 2

HOOSIER USERS GROUP
P.O. Box 2222
Indianapolis, IN 46206-2222

TIME DATED
January 17, 1993
MATERIAL

May 1993

Dan H. Eicher
P.O.Box 605
Mooresville, IN 46158

APPLICATION FOR MEMBERSHIP

Below you will find an application for membership to the Hoosier Users Group. Active membership entitles you to the Newsletter, up and download on the HUGbbs, attendance and voting rights at regular club meetings, access to the HUGger Library of Programs, special club activities and special guest speakers for one year.

Make check or money order payable to **Hoosier Users Group.** Send completed application to:

HOOSIER USERS GROUP
P.O. Box 2222
Indianapolis, IN 46206-2222

(Cut on dotted line)

Annual membership is $18.00
Due in May

New membership is prorated as follows:

May -------	April	$20.00
June ------	April	$18.50
July ------	April	$17.00
August ----	April	$15.50
September -	April	$14.00
October ---	April	$12.50
November --	April	$11.00
December --	April	$10.00
January	+ annual	$26.00
February	+ annual	$24.50
March	+ annual	$23.00
April	+ annual	$21.50

Name:_____ Today's Date:_____

Address:_____ Apt. #_____

City:_____ State:_____ Zip:_____

Phone: (_____) _____-_____

Interests/Comments:_____